

REMARKS

In response to the Final Office Action mailed March 12, 2010 and Advisory Action mailed May 19, 2010, Applicant respectfully requests reconsideration. To further the prosecution of this application, amendments have been made in the claims, and each of the rejections set forth in the Office Action has been carefully considered and is addressed below. The claims as presented are believed to be in condition for allowance.

Claims 2-4, 6-10, 12-14 and 16-20 were previously pending in this application. Claims 2, 3, 6, 12-13 and 16 are amended. Claims 4, 7, 14 and 17 are cancelled. No claims are added. As a result, claims 2-3, 6, 8-10, 12-13, 16 and 18-20 remain pending for examination, with claims 2 and 12 being independent. No new matter has been added.

Claim Rejections Under 35 USC § 103

Each of independent claims 2 and 12 is rejected under 35 U.S.C. §103(a) as purportedly being obvious over U.S. Patent No. 5,614,687 to Yamada et al. (“Yamada”) in view of U.S. Patent No. 6,518,492 to Herberger et al. (“Herberger”). As presented herein, each of claims 2 and 12 patentably distinguishes over any combination of the asserted references.

A. **Brief Overview Of Embodiments Of The Invention**

Applicant’s specification discloses that conventional techniques for determining a tempo of sound involve: (1) acquiring audio data in a musical composition as time-series data, (2) calculating an auto-correlation of the audio data to detect peak positions in the audio data and acquire candidates for a tempo, and (3) analyzing the beat structure of the musical composition on the basis of the peak positions in the autocorrelation pattern and levels of the peaks to estimate the tempo of the musical composition (see, e.g., Applicant’s specification at pp. 1-2).

Determining an auto-correlation of audio data and analyzing beat structure involves numerous complicated computational operations (p. 2). Many stereo systems (e.g., in-vehicle car

stereo or home audio systems) are ill-equipped for performing these operations, as the load on the central processing unit (CPU) is too great (p. 2). Accordingly, some embodiments of the invention provide a technique whereby the tempo of an input sound signal, such as a musical composition, may be determined simply and accurately without performing the auto-correlation and beat structure analysis that places such a large processing load on the stereo's CPU (p. 3).

The foregoing overview is provided to assist the Examiner in appreciating some aspects of the invention. However, this overview may not apply to each independent claim, and the language of each independent claim may differ in material respects from the overview above. Therefore, Applicant respectfully requests that careful consideration be given to the language of each independent claim, and that each be addressed on its own merits, without relying on the overview above. In this respect, Applicant does not rely on the overview above to distinguish any of the claims over the prior art, but rather relies only upon the claim language and the arguments presented below.

B. Rejection of Claim 2

Amended claim 2 recites a tempo analyzing apparatus. The apparatus comprises, *inter alia*, a frequency band extracting means for extracting a sound signal of a frequency in a predetermined frequency band from an input sound signal; a volume calculating means for calculating a volume of the sound signal extracted by the frequency band extracting means; a threshold setting means for setting a threshold used to detect a peak of change in level with reference to the volume calculated by the volume calculating means; a peak detecting means for detecting positions of a plurality of ones, higher than a predetermined threshold, of peaks of change in level of the sound signal extracted by the frequency band extracting means, the peaks of change in level being detected in accordance with the threshold set by the threshold setting means, the positions including at least one reference position; and a time interval detecting means for detecting a time interval between the at least one reference position and one or more others of the positions detected by the peak detecting means in a predetermined unit-time interval.

Neither Yamada nor Herberger says anything at all relating to a volume calculating means for calculating a volume of a sound signal extracted by frequency band extracting means, a threshold setting means for setting a threshold used to detect a peak of change in level with reference to the volume calculated by the volume calculating means, and a peak detecting means for detecting positions for a plurality of ones, higher than a predetermined threshold, of peaks of change in level of the sound signal extracted by the frequency band extracting means, with the peaks of change in level being detected in accordance with the threshold set by the threshold setting means. These limitations recited by claim 2 are substantially similar to those which were recited by formerly pending claims 4 and 6, which are now cancelled. The Office Action contends that these limitations are satisfied by Yamada in a passage at col. 3, lines 23-29. This contention is unsupported by the reference.

In the cited passage, Yamada discloses features of an apparatus for measuring beats per minute (BPM) in an input sound signal (col. 3 lines 7-9). The apparatus includes BPM detector 101 (Fig. 1) which includes a band pass filter (BPF) that receives an input signal, extracts a low frequency component, and supplies an output signal to one of two fixed contacts connected to a peak data holding circuit 3 (col. 3, lines 14-22). Yamada discloses that the peak data holding circuit detects the maximum value of the supplied signal, and is connected to a slice level generating circuit 4 (col. 3 line 23-26). The slice level generating circuit 4 generates the slice level signal indicative of a reduced value of the maximum value detected by the peak data holding circuit and outputs it (col. 3 line 26-29). This passage simply has nothing to do with calculating a volume of an extracted sound signal in a predetermined frequency band, setting a threshold used to detect a peak of change in level with reference to the calculated volume, or detecting positions of peaks of change in accordance with the set threshold, as claim 2 recites. The remainder of Yamada also says nothing at all regarding these limitations of claim 2.

Herberger fails to remedy this deficiency of Yamada. Herberger also says nothing at all relating to calculating a volume of an extracted sound signal in a predetermined frequency band, setting a threshold used to detect a peak of change in level with reference to the calculated volume, or detecting positions of a plurality of peaks of change in level in accordance with the set threshold.

Amendment dated

Reply to Office Action of May 19, 2010

In addition, neither Yamada nor Herberger says anything at all relating to a peak detecting means for detecting positions of plurality of ones, higher than a predetermined threshold, of peaks of change in level of a sound signal, the positions including at least one reference position; and time interval detecting means for detecting a time interval between the at least one reference position and one or more others of the positions detected by the peak detecting means in a predetermined unit-time interval, as recited by claim 2. Neither reference says anything that relates even remotely to these limitations.

Accordingly, amended claim 2 patentably distinguishes over any combination of the asserted references, such that the rejection of claim 2 under 35 U.S.C. §103(a) as purportedly being obvious over Yamada in view of Herberger should be withdrawn.

C. Rejection of Claim 12

Amended claim 12 recites a tempo analyzing method. The method comprises, *inter alia*, extracting a sound signal of a frequency included in a predetermined frequency band from an input sound signal; calculating a volume of the extracted sound signal; setting a threshold used to detect a peak position with reference to the calculated volume; detecting positions of a plurality of ones, higher than a predetermined threshold, of peaks of change in level of the extracted sound signal, the peaks of change in level being detected in accordance with the set threshold, the positions including at least one reference position; and detecting a time interval between the at least one reference position and one or more others of the detected positions in a predetermined unit-time interval.

It should be appreciated from the discussion above relating to claim 2 that neither Yamada nor Herberger discloses or suggests a tempo analyzing method which comprises calculating a volume of an extracted sound signal in a predetermined frequency band; setting a threshold used to detect a peak position with reference to the calculated volume; detecting positions of a plurality of peaks of change in level of the extracted sound signal, the peaks of change in level being detected in accordance with the set threshold, the positions including at least one reference position; and detecting a time interval between the at least one reference position and one or more others of the detected positions in a predetermined unit-time interval, as recited by amended claim 12.

Accordingly, amended claim 12 patently distinguishes over any combination on the asserted references, such that the rejection of claim 12 under 35 U.S.C. §103(a) as purportedly being obvious in view of Yamada in view of Herberger should be withdrawn.

Claims 13, 16 and 18-20 depend from claim 12 and are allowable for at least the same reasons.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, the Director is hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 23/2825, under Docket No. S1459.70086US00.

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Respectfully submitted,

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